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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/533,773      | 05/04/2005  | Mats.Hedman          | 1509-1051           | 8225             |

466 7590 10/17/2006

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| EXAMINER |
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ALI, HYDER

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| ART UNIT | PAPER NUMBER |
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3747

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/533,773 | <b>Applicant(s)</b><br>HEDMAN, MATS |  |
|                              | <b>Examiner</b><br>HYDER ALI         | <b>Art Unit</b><br>3747             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/4/05</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 1-12 are objected to because of the following informalities: the selection of the frequency of power stroke must be shown or cancelled; the selection of the frequency of 2-stroke and 4-stroke must be shown or cancelled; torque must be shown or cancelled; data map for intake valve closing should be shown or cancelled; data map for exhaust valve closing should be shown or cancelled. Appropriate correction is required.

### ***Specification***

The abstract of the disclosure is objected to because abstract of the disclosure must be on a separate sheet without the drawing. Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denbratt (US 6,581,551) in view of Miura (US 6,523,504).

Denbratt discloses a four-stroke internal combustion engine includes variable geometric compression ratio, electrically operated inlet valves and a device for supplying a homogeneous fuel/air mixture to the engine cylinders. The inlet valves and the

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compression ratio are controlled by a control unit, so that the fuel/air mixture, within a lower engine rpm range, is compressed to self-ignition. See Abstract.

Denbratt does not disclose operating the engine in two stroke and four stroke.

Miura discloses operating the engine in two stroke and four stroke. See col. 7, lines 5-15.

It would have been obvious to a person having ordinary skill in the art to modify Denbratt by employing operating the engine in two stroke and four stroke as taught by Miura. The motivation to do so would have been to provide Denbratt engine capable of operating in a variable cycle such as two stroke and four stroke.

With regard to Claim 2, Denbratt discloses combustion chamber volume varies as the load varies.

With regard to Claim 3, Miura discloses selection of the frequency of power strokes.

With regard to Claim 4, Denbratt discloses the volume of the compression chamber is selected in combination with a selection of the times for opening and closure of the inlet valves as well as the outlet valves.

With regard to Claim 5, Miura discloses a different frequency of power strokes are chosen for different cylinders.

With regard to Claim 6, Miura discloses power strokes are performed with early closure of the inlet valves. See Fig. 6.

With regard to Claim 7, Miura discloses power strokes are performed with delayed opening of the outlet valves.

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With regard to Claims 8,9, Denbratt discloses volume of the compression chamber is controlled.

With regard to Claim 10, Miura discloses power stroke is independent of the torque.

With regard to Claim 11, Miura discloses two cycle and 4-cycle selection.

With regard to Claim 12, Miura discloses a control unit for signal control.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HYDER ALI whose telephone number is (571) 272-4836. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Kirk Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*Hyder AL*

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